

Impact Of Banking Supervision Standard On Country Credit Indicators

Yevhen Pavliuk, Olena Pavliuk, Tetiana Halakhova, Tetiana Bludova

Abstract: The article examines the non-returned assets and liabilities by non-financial sector, households, corporate sector for the countries of Central and Eastern Europe for the period 2010-2017, which are subordinated to Basel 1 and Basel 2. By Bayesian approach, the shares of each group of non-returned groups were found assets and liabilities in their totals and their average sample values for each group of countries and their shares over the period under study. For the qualitative assessment of the important characteristics of liquidity and credit risks of the banking system for each country, a 5-point scale of relative importance for peer-reviewed peer assessments is selected. The matrix of each element in the group of non-repaired assets and liabilities of the expert group on the priority scale of each element are represented. A system for determining the coordinates of eigenvectors is drawn up, the characteristic equation in the form of a third order determinant is solved, and the maximum eigenvalue of the matrix is found. A qualitative assessment was made of these indicators. It is proved that all the countries of Central and Eastern Europe by levels of non-returned assets and liabilities can be attributed to two levels. It is shown that banking supervision systems these countries need to research the bad debts of banks, credit risk mitigation.

Index Terms: Basel 1, Basel II, Basel III, Bayesian approach, expert matrix, non-repaired assets, liabilities, credit risk, eigenvector, characteristic equation.

1 INTRODUCTION

The process of forming European Union banking supervisory institutions has taken place within the framework of a debate: each country makes its own decisions on how to act in these conditions, or join forces to strengthen cooperation within EU countries to provide a united front against the economic impact of the financial crises. Basel II's core approaches have encouraged banks to continuously develop their risk management practices. In our opinion, the changes that have taken place in the financial system and in particular in international banking management have been related to certain processes, the essence of which is as follows:

- there is a process of improving the capacity of banks to measure and manage risks;
- active management and diversification of the portfolio;
- efficiency of managing the problems of risky areas of work in banks is improving;
- integrates risk management more closely with the capital planning process.

The main components of Basel III are capital reform, the introduction of the latest liquidity standards and the improvement of risk management (full coverage of all risks). The key approach to quantifying capital and defining Basel II is

unchanged - Basel III leaves the risk-weighted capital adequacy regime in place. This means that regulators will continue to pay particular attention to risk management and corporate governance as major drivers of financial stability, and will apply more stringent requirements to financial institutions that do not comply with their recommendations. New standards of the standards of the share capital are presented in table. 1

TABLE 1 CAPITAL REQUIREMENTS UNDER BASEL II AND BASEL III, %

Indicator	common equity tier 1		tier 1 capital		total capital	
	Basel II	Basel III	Basel II	Basel III	Basel II	Basel III
Minimum capital	2	4,5	4	6	8	8
Conservation buffer	0	2,5	–	–	–	–
Minimum + conservation buffer	7	7	8,5	8,5	10,5	10,5
Counter-cyclical buffer	0	2,5	–	–	–	–

Source: BCBS

As can be seen from the table 1, there is an increase in capital requirements. In particular, the introduction of an additional 2.5% capital buffer helps ensure that banks can use it to cover losses in times of crisis. This buffer is included in Tier 1 capital. The countercyclical buffer, which ranges from 0% to 2.5%, is planned to be implemented taking into account national specificities. Given the rise in minimum capital adequacy requirements, analysts advocate for banks to move to the Advanced IRB Approach for credit risk analysis and management [1]. According to BCBS guidelines, banks with a sufficiently developed internal capital management process are allowed to use more risk management tools to move to the Advanced IRB Approach to determine the required amount of capital to cover the risks [2, 3, 4]. Thus, Basel III is a comprehensive reform package developed by the Basel Committee on Banking Supervision to strengthen regulation, supervision and risk management of the banking sector. These measures aim to enhance the ability of the banking sector to overcome the financial and economic stress of shocks

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irrespective of their origin, to improve risk management and governance, to enhance transparency and openness of banks [5]. The size of non-performing assets and liabilities is a consequence of the introduction of banking supervision reforms, among other factors [6]. As the experience of Central and Eastern European countries shows, the effects of the debt crisis can be devastating for the national economy of the country, as the risk of liquidity of the banking system increases, the real threat of withdrawal of depositors from bank accounts increases, as well as the dismissal of highly qualified employees from the banking system [7]. Insolvency and loss of liquidity of most banks in Ukraine are based on the existence of problematic debt. Therefore, it is advisable to analyze the size of non-recovered assets and liabilities by non-financial sector, households and corporate sector.

2 LITERATURE REVIEW

Management of international competitiveness in the context of globalization of economic development conceptual issues of risk management should be considered through the prism of methodological developments presented by the international banking community in the Basel Accords [1-7]. In [8], it is emphasized that the most widely considered comments and additions of bankers of different countries are embodied in Basel II, supplemented by Basel I. Bank risk management in the following three main areas:

- Minimum capital requirements - the bank's capital, with appropriate deductions, may not be less than 8% of assets weighted by appropriate risk factors;
- supervisory oversight - the assessment and control of capital adequacy are fully vested in banks. Supervisory institutions are called upon to monitor the effectiveness of internal control procedures for risk assessment at the bank;
- Market discipline - disclosure of financial information by the bank, its transparency.

The authors of [10] investigate that, within Basel III, work continued on detailing the minimum capital adequacy ratios and developing a more sophisticated RWA. The main objective is to eliminate the shortcomings identified during the application of Basel II. The new structure, in particular, addresses the following aspects:

- new capital requirements with a Credit Valuation Adjustment (CVA). This is the difference between the value of the portfolio without risk and the real value of the portfolio, which takes into account the possibility of default of the counterparty. In other words, CVA is the market value of the counterparty's credit risk;
- new requirements for covering banks' capital risks with respect to central counterparties;
- increased requirements of quantitative nature - mainly to credit institutions that use calculation methods based on internal models;
- high quality requirements.

Basel III introduces an indicator of "leverage", designed to prevent excessively high levels of debt load on both balance sheet and off-balance sheet items [11, 12]. That is, in addition to the minimum share capital, banks are required to have at their disposal a minimum set amount of Tier 1 capital, taking into account the total amount of risks on the balance sheet and

off-balance sheet items. One of the key provisions of Basel III is to increase the level 1 share capital from 2% to 4.5%. Although banks in some countries in the world are already following this recommendation, comprehensive implementation of this provision may be problematic in a global crisis, as it may affect banks' under-capital, which in turn will lead to reduced lending and increased lending costs in general [13, 14, 15]. It should be noted that the experience of foreign countries in the application of banking supervision and regulation and the development of banking supervision and regulation of Ukraine in the context of world experience is widely represented in the works of Ukrainian scientists [16, 17]. However, problems and trends in the development of banking supervision systems in Central and Eastern Europe remain insufficiently disclosed in the scientific literature. It is important to study the functions of the basic elements of the banking supervision system in the context of the formation of the world financial architecture. Of theoretical and practical importance are the studies of current banking supervision imperatives of EU countries and the prognostic trends of development in the countries of Central and Eastern Europe. The paradigm-based principles of banking supervision of Central and Eastern European countries, based on a risk-based approach, are required.

3 RESULTS

Table 2 presents non-returnable assets and liabilities by non-financial sector for Central and Eastern Europe for the period 2010-2017, reporting by Basel 1.

TABLE 2 DATA ON NON-REPAYABLE NON-FINANCIAL SECTOR ASSETS AND LIABILITIES FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES 2010-2017, (BASEL 1).

Country Basel 1	2010	2011	2012	2013	2014	2015	2016	2017
Albania	13,96	18,77	22,5	23,4	22,8	18,22	18,27	13,23
Armenia	3,3	3,8	3,9	4,6	6,8	7,9	6,7	5,6
Belarus	3,7	3,68	5,82	4,7	4,6	7,6	14,7	14,5
Bosnia and Herzegovina	9,3	12	13,3	14,8	14	12,9	11,6	9,7
Croatia	11,5	12,7	14,4	19,1	20,7	20	17,6	13,7
Estonia	6,1	4,6	3,1	2	1,8	1,3	1,3	1
Slovakia	6,07	5,75	5,36	5,9	5,5	4,8	4,5	3,6
Slovenia	7,2	11,1	14,4	13,3	11,9	9,9	6,6	4,6
Ukraine	14,6	13,8	16,5	12,9	19	22	28	33,6

Source: BCBS

Table 3 summarizes the non-returnable assets and liabilities by non-financial sector for the countries of Central and Eastern Europe for the period 2010-2017, reporting by Basel 2.

TABLE 3 DATA ON NON-REPAYABLE NON-FINANCIAL SECTOR ASSETS AND LIABILITIES FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES FOR THE PERIOD 2010-2017 (BASEL 2)

Country Basel 2	2010	2011	2012	2013	2014	2015	2016	2017
Austria	4,7	4,5	4,7	4,1	4,4	4,3	3,6	2,8
Bulgaria	8,01	9	10,2	10,03	9,3	11	12,3	10,17
Czech Republic	7	6,6	6,2	6,2	6,4	6,1	4	3,2
Hungary	27,3	36,4	36,8	17,2	16,4	13,7	14,3	8,6
Georgia	5,6	4,64	3,82	7,55	3,09	2,75	3,7	2,8
Latvia	19,8	18,1	11,6	8,8	7,3	6,3	4,8	4,5
Lithuania	19,5	16,27	13,87	10,7	6,32	5,11	3,7	2,8
Macedonia	9,3	9,9	10,5	11,5	11,3	10,8	6,6	6,3
Montenegro	96,33	97,31	97,32	98,42	97,49	98,85	98,4	96,4
Poland	8,8	8,2	8,9	8,5	8,1	7,5	7,1	6,8
Romania	11,9	14,3	18,2	21,9	14	18,1	12,9	8,7

Russia	9,7	7,7	6,7	6,8	7,9	10	11	11,4
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Source: BCBS

Table 4 presents the data of non-returned assets and liabilities by household for the countries of Central and Eastern Europe for the period 2010-2017, reporting to Basel 1.

TABLE 4 DATA ON NON-REPATRIATED HOUSEHOLD ASSETS AND LIABILITIES FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES 2010-2017, (BASEL 1)

Country Basel 1	2010	2011	2012	2013	2014	2015	2016	2017
Albania	11,77	15,84	17,2	16,71	16,5	13,32	10,18	7,64
Armenia	4,3	3,5	3,7	5,5	6,4	8,1	7,3	4,8
Belarus	4,8	4,59	7,16	0,93	1,4	1,01	0,79	0,53
Bosnia and Herzegovina	6,1	0,8	10,5	10	9,7	9	8,2	7,3
Croatia	7,8	8,6	9,5	11,1	12	11,8	10	7,8
Estonia	5	4,3	3,2	2,6	2,2	1,5	1	0,7
Slovakia	5,12	4,85	4,33	4,1	4,5	8,9	3,7	3,2
Slovenia	4	4,5	4,9	4,1	5,3	4,7	2,6	2,4
Ukraine	4,3	4,3	6,2	4,6	7,1	7,9	7,9	5,4

Source: BCBS

Table 5 summarizes the data on non-recoverable assets and liabilities by household for the countries of Central and Eastern Europe for the period 2010-2017, reporting by Basel 2.

TABLE 5 DATA ON NON-REPATRIATED HOUSEHOLD ASSETS AND LIABILITIES BY COUNTRIES OF CENTRAL AND EASTERN EUROPE FOR THE PERIOD 2010-2017 (BASEL 2)

Country Basel 2	2010	2011	2012	2013	2014	2015	2016	2017
Austria	6,3	5,6	5,5	5,1	5	4,5	3,1	2,7
Bulgaria	7,09	9,2	10,5	10	9,4	10,9	12,5	10,13
Czech Republic	5,2	5	5,2	5	4,7	4,1	3,2	2,5
Hungary	22,7	36,7	35,4	18,5	19	17,6	16,8	11,1
Georgia	3,93	2,07	3,08	1,63	2,36	2,24	2	1,9
Latvia	18,7	19,6	15,1	11,9	9,6	8	5,4	4
Lithuania	5,3	5	5,1	5,3	5,2	4,9	4,8	3,7
Macedonia	8,1	7,5	7,1	6,4	5,9	5,2	2,6	2,4
Montenegro	19	19,1	19,4	23,26	24,29	25,11	26,2	28,8
Poland	7,2	7,2	7,4	7,1	6,5	6,2	6	6,1
Romania	10	11,3	12,3	13,5	7,9	9,6	7,3	5,8
Russia	10,3	7,9	6,5	7,5	9,9	12,9	11,8	9,8

Source: BCBS

Table 6 summarizes the non-returned assets and liabilities by cross section of the corporate sector for the countries of Central and Eastern Europe for the period 2010-2017, reporting to Basel 1.

TABLE 6 CORPORATE SECTOR RECOVERY ASSETS AND LIABILITIES FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES 2010-2017, (BASEL 1)

Country Basel 1	2010	2011	2012	2013	2014	2015	2016	2017
Albania	20,8	15,4	25,9	27,6	26,7	21,4	22,9	16,8
Armenia	3,9	2,8	4	4,3	6,3	7,9	7,6	6,3
Belarus	0,47	0,52	0,4	5,7	5,4	9,1	18,3	18,9
Bosnia and Herzegovina	13,2	12,3	15,9	19,4	18,4	16,8	15	12,1
Croatia	20,1	18,1	25	28,3	30,8	30,1	28,3	22,2
Estonia	5,9	8,5	3,7	1,8	1,9	1,6	1,7	1,4
Slovakia	7,97	8,2	7,63	8,1	8,6	7,3	6,5	5,2
Slovenia	18,5	12,3	24	20,4	17,7	15,4	7,6	5,4
Ukraine	9,5	10,3	10,3	8,3	11,9	20	20	28,2

Source: BCBS

Table 7 summarizes the non-returned assets and liabilities by

cross section of the corporate sector for the countries of Central and Eastern Europe for the period 2010-2017, reporting to Basel 2.

TABLE 7 CORPORATE SECTOR NON-RETURNABLE ASSETS AND LIABILITIES FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES 2010-2017, (BASEL 2)

Country Basel 2	2010	2011	2012	2013	2014	2015	2016	2017
Austria	4,1	4,2	4,1	4	4,1	4,2	4,7	4
Bulgaria	9,3	8	10,3	10,6	9	11,2	12,8	10,12
Czech Republic	8,2	9	7,4	7,2	6,6	5,7	5,2	4,2
Hungary	36	32,7	38,2	15,8	13,6	9,7	11,6	6,3
Georgia	6,26	6,5	4,31	5,91	3,66	3,1	5	3,6
Latvia	17,2	21	9,2	6,6	5,7	5,3	4,5	4,9
Lithuania	15	18	8,8	7	6,9	6,7	6,5	5,5
Macedonia	11,4	10	12,9	15,2	15,3	15,2	9,9	10
Montenegro	74,3	74	73,78	74,35	71,32	71,56	71,7	67,6
Poland	10,4	12,4	11,8	11,6	11,2	10,2	9,2	8,3
Romania	16,9	13,6	23,6	29,2	20	27,1	19,3	12,2
Russia	7,6	9,5	7	6,5	7,2	9,1	10,7	12

Source: BCBS

Introduce the following notation for three groups of non-performing assets and liabilities:

NFA_i^n - non-recovered assets and liabilities by non-financial assets;

HH_i^n - non-returned assets and liabilities by households;

CS_i^n - non-recovered corporate sector assets and liabilities; and

i - country number ($i=1,9$ - for Basel 1 countries; $i=1,12$ - for Basel 2 countries) By Bayesian approach, we find the shares of each group of non-returned assets and liabilities in their sum $S = NFA_i^n + HH_i^n + CS_i^n$ and their average sample values for the period 2010-2017 for each group of countries of Central and Eastern Europe.

Table 8 presents the average sample shares of the non-returned assets and liabilities groups for the countries of Central and Eastern Europe for the period 2010-2017 that report to Basel 1 in the designations

$$A = \frac{NFA_i^n}{NFA_i^n + HH_i^n + CS_i^n}, B = \frac{HH_i^n}{NFA_i^n + HH_i^n + CS_i^n}, C = \frac{CS_i^n}{NFA_i^n + HH_i^n + CS_i^n}$$

TABLE 8 AVERAGE SAMPLE OF NON-RETURNABLE ASSETS AND LIABILITIES GROUPS FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES 2010-2017 (BASEL 1)

Country Basel 1	A	B	C
Albania	11,77	15,84	17,2
Armenia	4,3	3,5	3,7
Belarus	4,8	4,59	7,16
Bosnia and Herzegovina	6,1	0,8	10,5
Croatia	7,8	8,6	9,5
Estonia	5	4,3	3,2
Slovakia	5,12	4,85	4,33
Slovenia	4	4,5	4,9
Ukraine	4,3	4,3	6,2

Source: author's calculations

Table 9 presents the average sample shares of the non-returned assets and liabilities groups for the countries of Central and Eastern Europe for the period 2010-2017, reporting to Basel 2.

TABLE 9 AVERAGE SAMPLE OF NON-RETURNABLE ASSETS AND LIABILITIES GROUPS FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES 2010-2017 (BASEL 2)

Country Basel 2	A	B	C
Austria	0,316555	0,356559	0,326886
Bulgaria	0,332224	0,330127	0,337649
Czech Republic	0,340164	0,259993	0,399843
Hungary	0,332913	0,366012	0,301074
Georgia	0,363657	0,217517	0,418825
Latvia	0,32701	0,378117	0,294874
Lithuania	0,374731	0,234806	0,390463
Macedonia	0,344027	0,199223	0,456749
Montenegro	0,505848	0,119679	0,374473
Poland	0,288154	0,330322	0,381525
Romania	0,316555	0,356559	0,326886
Russia	0,332224	0,330127	0,337649

Source: author's calculations

For a qualitative assessment for each country of the important characteristics of the liquidity and credit risks of the banking system, we choose a 5-point scale of relative importance for peer assessments in paired comparisonst (Table 10).

TABLE 10 5-POINT SCALE OF RELATIVE IMPORTANCE FOR PEER REVIEW

Intensity of relative importance	Quality assessment	Explanation
1	Equally important	Both elements contribute equally to the end goal
2	Not much more important	There are verbal statements about the priority of one element over another, but these statements are quite convincing
3	Significantly more important	There are enough compelling arguments and logical criteria that make one of the elements more important (more important)
4	Much more important	There is convincing evidence of the great importance of one element compared to another
5	Absolutely more important	Awareness of the priority of one element over another is affirmed as much as possible

Table 11 presents a matrix of pairwise comparisons of the importance of each element in the asset and liability group, which is drawn up by an expert group on the priority scale of each element (Table 9).

TABLE 11 MATRIX OF MATCHED EXPERT COMPARISON IN THE NON-RETURNED ASSETS AND LIABILITIES GROUP

	CS_i^n	HH_i^n	NFA_i^n	
CS_i^n	1	2	2	CS_i^n
HH_i^n	0,5	1	2	HH_i^n
NFA_i^n	0,5	0,5	1	NFA_i^n
	CS_i^n	HH_i^n	NFA_i^n	

We make a system for determining the coordinates of eigenvectors:

$$\begin{cases} (1-\lambda)x_1 + 2x_2 + 2x_3 = 0, \\ 0,5x_1 + (1-\lambda)x_2 + 2x_3 = 0, \\ 0,5x_1 + 0,5x_2 + (1-\lambda)x_3 = 0. \end{cases} \quad (1)$$

We make a characteristic equation in the form of a third-order determinant:

$$\begin{vmatrix} (1-\lambda) & 2 & 2 \\ 0,5 & (1-\lambda) & 2 \\ 0,5 & 0,5 & (1-\lambda) \end{vmatrix} = (1-\lambda)^3 + 0,5 + 2 - 3 - 3\lambda = -\lambda^3 + 3\lambda^2 + 0,5 = 0 \quad (2)$$

Find the roots of the equation:

$$\lambda_1 = 1 + \frac{1}{\sqrt[3]{2}} + \sqrt[3]{2} = 3,05362157587897,$$

$$\lambda_2 = 1 - \frac{1+i\sqrt{3}}{2^{2/3}} + \frac{i(\sqrt{3}+i)}{2\sqrt{2}},$$

$$\lambda_3 = 1 - \frac{1+i\sqrt{3}}{2\sqrt{2}} + \frac{i(\sqrt{3}+i)}{2^{2/3}}. \quad (3)$$

We choose the maximum eigenvalue $\lambda_1 = 3,0536$ (Fig. 1).

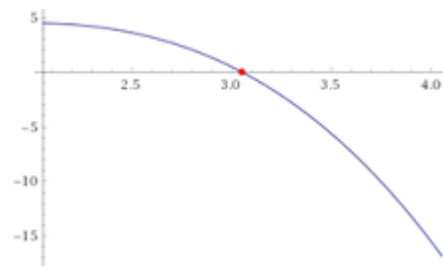


Figure 1. Graphic interpretation of the maximum eigenvalue as the root of equation (2)

We find an error for the level of consistency of expert judgments by the formula:

$$\begin{aligned} & (\lambda_{MAX} - n) / (n-1) \cdot 0,58 = \\ & = ((3,0536 - 3) / 1,16) \cdot 100\% = \\ & = 0,046225 \cdot 100\% \approx 4,62\% < 10\%. \end{aligned} \quad (4)$$

where n = 3 is the order of the matrix and the number 0.58 is the average of the homogeneity index for the third order of the matrix.

Therefore, the matrix in table 9 is an adequate matrix of expert estimates and weights W for the indicators NFA_i^n , HH_i^n , CS_i^n , respectively, will be:

$$\begin{aligned} W_{NFA_i^n} &= 0,1958, \\ W_{HH_i^n} &= 0,310814, \\ W_{CS_i^n} &= 0,493386. \end{aligned} \quad (5)$$

We calculate the LEVEL level of non-returnable assets and liabilities for of Central and Eastern European countries by the formula:

$$LEVEL = \frac{NFA_i^n \cdot HH_i^n}{NFA_i^n + HH_i^n + CS_i^n} \cdot W_{NFA_i^n} + \frac{NFA_i^n}{NFA_i^n + HH_i^n + CS_i^n} \cdot W_{HH_i^n} + \frac{CS_i^n}{NFA_i^n + HH_i^n + CS_i^n} \cdot W_{CS_i^n} \quad (6)$$

Table 12 presents the level of non-repayable assets and liabilities for the countries of Central and Eastern Europe: LEVEL (1) - for 9 countries (Basel 1).

TABLE 12 LEVELS OF NON-REPAYABLE ASSETS AND LIABILITIES OF CENTRAL AND EASTERN EUROPEAN COUNTRIES(BASEL 1)

Country Basel 1	LEVEL(1)	Ranking
Ukraine	0,318555	1
Belarus	0,324596	2
Armenia	0,333113	3
Estonia	0,344546	4
Albania	0,345609	5
Bosnia and Herzegovina	0,350558	6
Slovakia	0,354655	7
Slovenia	0,363935	8
Croatia	0,364839	9

Source: author's calculations

Table 13 presents the level of non-repayable assets and liabilities for the countries of Central and Eastern Europe: LEVEL (2) - for 10 countries (Basel 2).

TABLE 13 LEVELS OF NON-REPAYABLE ASSETS AND LIABILITIES OF CENTRAL AND EASTERN EUROPEAN COUNTRIES(BASEL 2)

Country Basel 2	LEVEL(2)	Ranking
Montenegro	0,321003	1
Latvia	0,327039	2
Hungary	0,327492	3
Austria	0,334086	4
Romania	0,334086	5
Russia	0,334249	6
Bulgaria	0,334249	7
Lithuania	0,339002	8
Czech Republic	0,344691	9
Georgia	0,345454	10
Poland	0,347328	11
Macedonia	0,354636	12

Source: author's calculations

As can be seen from the table, the analysis of the debt on the three indicators in the countries of Central and Eastern Europe was carried out, and a qualitative assessment of these indicators was provided.

4 DISCUSSION

The study concludes that the 2008 financial crisis has led to a significant increase in the volume of bad loans and their share in the loan portfolios of banks in many Central and Eastern European countries. Not only Ukraine but also most of the countries of Central and Eastern Europe (especially in the post-crisis period) have a sharp deterioration of the problem loans situation. In 2014-2017, the situation in many European countries improved, which cannot be said about the Ukrainian realities. All Central and Eastern European countries in terms of non-returnable assets and liabilities can be attributed to two levels: LEVEL (1) for 9 countries (Basel 1); LEVEL (2) for 10 countries (Basel 2). The first LEVEL (1) includes: Ukraine, Belarus, Armenia, Estonia, Albania, Bosnia and Herzegovina, Slovakia, Slovenia, Croatia. The second LEVEL (2) includes: Montenegro, Latvia, Hungary, Austria, Romania, Russia, Bulgaria, Lithuania, Czech Republic, Georgia, Poland, Macedonia. In most countries of the world, banks are actively reforming their own risk management systems, which has not allowed them to build up bad debt. This is evidenced by the experience of countries belonging to LEVEL (2) that implement

the Basel II recommendations. LEVEL countries (1), including Ukraine, were most vulnerable to the negative changes caused by the 2008 financial crisis, as they adhered to the Basel I. Therefore, the banking supervision systems of these countries need to investigate problematic bank debt, reduce credit risks through the introduction of methodologies. Basel II Borrower Credit Risk Assessment. The main recommendations of the Basel Committee on how to calculate credit risk are to apply: 1) the standardized method; 2) a method based on internal ratings (IRB-approach) basic and complex approaches. Finding and developing new and improving existing methods of managing bad loans are the main tasks facing the banking institutions of Central and Eastern Europe and Ukraine in particular.

5 CONCLUSIONS

An analysis of three central and eastern European debt indicators has led to the conclusion that the 2008 financial crisis led to a significant increase in the volume of bad loans and their share in the loan portfolios of banks in many Central and Eastern European countries. Not only Ukraine but also most of the countries of Central and Eastern Europe (especially in the post-crisis period) have a sharp deterioration of the problem loans situation. During the years 2014-2017 the situation in many European countries has improved, which cannot be said of the Ukrainian realities. In most countries of the world, banks are actively reforming their own risk management systems, which has not allowed them to build up bad debt. This is evidenced by the experience of countries belonging to LEVEL (2) that implement the Basel II recommendations. LEVEL countries (1), including Ukraine, have been most vulnerable to the adverse changes caused by the 2008 financial crisis, as they adhere to the Basel I. The banking supervision systems of these countries therefore need to investigate problematic bank debt and reduce credit risks through the introduction of Basel II credit risk assessment techniques for borrowers. The main recommendations of the Basel Committee on how to calculate credit risk are to apply: 1) the standardized method; 2) internal rating method (IRB approach): basic and complex approaches. Finding and developing new and improving existing methods of managing bad loans are the main tasks facing the banking institutions of Central and Eastern Europe and Ukraine in particular.

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